COAL MINING

January, 1961 Volume 38, No. 1

UNIVERSITY MICROFILMS
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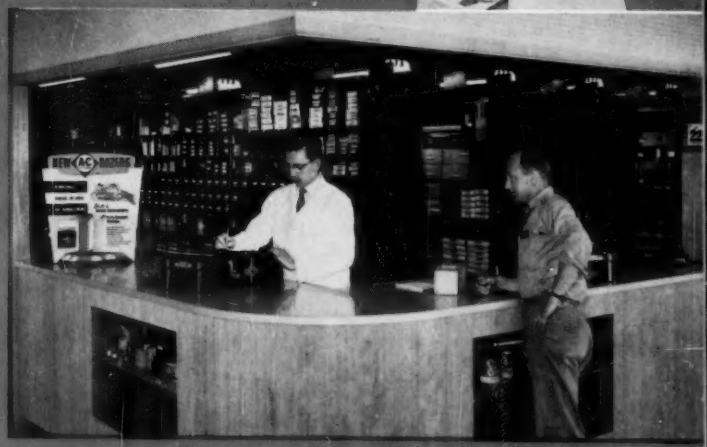
ANN ARBOR, MICH

Highway in Du Bois serves "heart" of coal area

Jack Docherty
Du Bois Manager

▼ Section of Du Bois parts department



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The world's finest mining machinery—Allis-Chalmers Tractors and Tractoloaders, Lima Shovels, Jaeger Pumps—is backed by 8 a.m. to 3 a.m. service by expert, factory trained mechanics. *Open 24 hours for emergency work.*

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COAL MINING

Vol. XXXVIII January, 1961 No. 1

Contents

Do You Know ---------- 4

Here and There in the Coal Industry - 4

Seventy-fourth Meeting of the Coal Mining Institute of America ---------- 6

Hansel Coal Company Uses Late Type Equipment ---- 7

Keys to Profitable Purchasing Specifications ------ 9

TIPS for Successful Ripping -------- 15

Cat Announces Two New Power Shifted Wheel Tractor-Scrapers ------ 17

Late Type Machinery and Methods Used at Howe Coal Company ---------- 20

Advertiser's Index ---------- 23

Published by

Modern Mining Publishing Company

4575 Country Club Drive

Pittsburgh, Pa. Phone TU. 1-9411

P F. JASIK, Publisher and Editor

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Printed by

ADVANCE PRINTING & LITHO CO.

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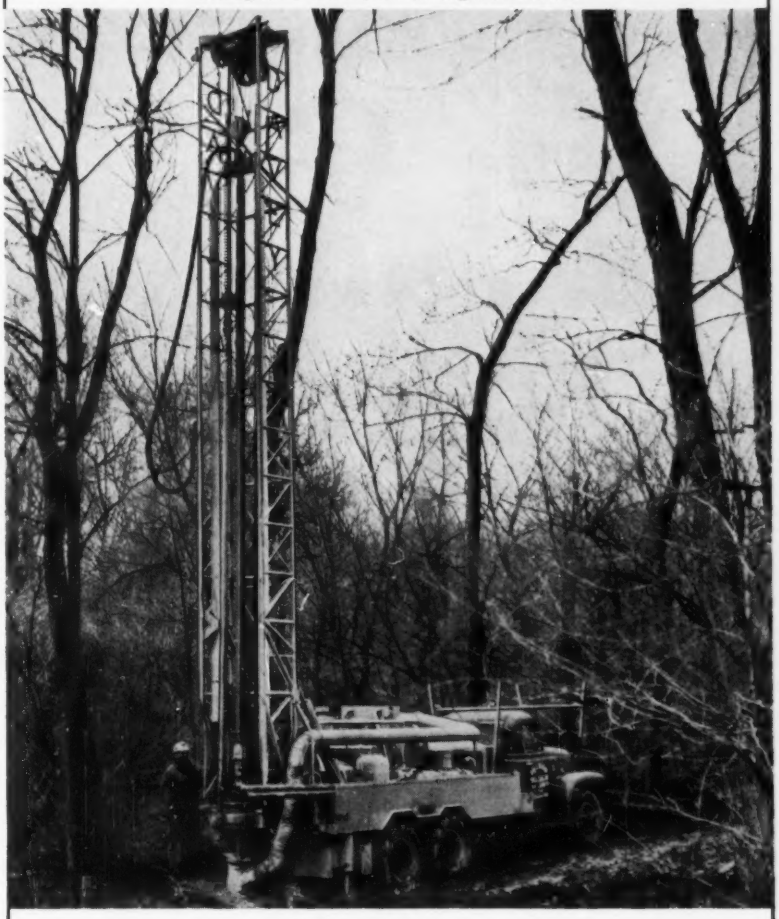
Davey Model M-75A Rotary Drill coal testing for Harbaugh Coal Co., Madison, Pa. Working in the woods, it is drilling 300 ft. holes.



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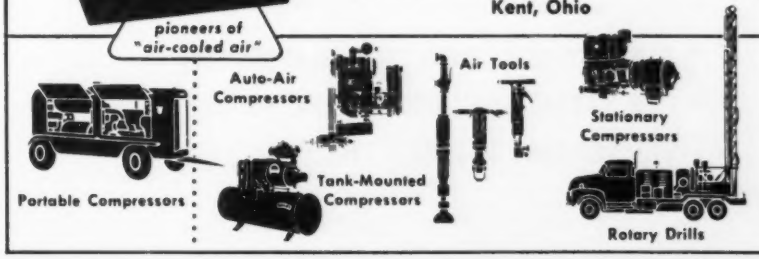

Published monthly by Modern Mining Publishing Company. Publication Office—Advance Printing & Litho Co., Erie, Pa. Editorial and Executive Offices—Erie, Pa. Pittsburgh Offices—P. F. JASIK, Publisher, 4575 Country Club Drive, Pittsburgh 36, Pa. Price: In the United States, $3.00 year; all other countries $5.00. Single copy 25 cents. Entered as second class matter at the Post Office at Erie, Penna., under the act of March 3, 1879.

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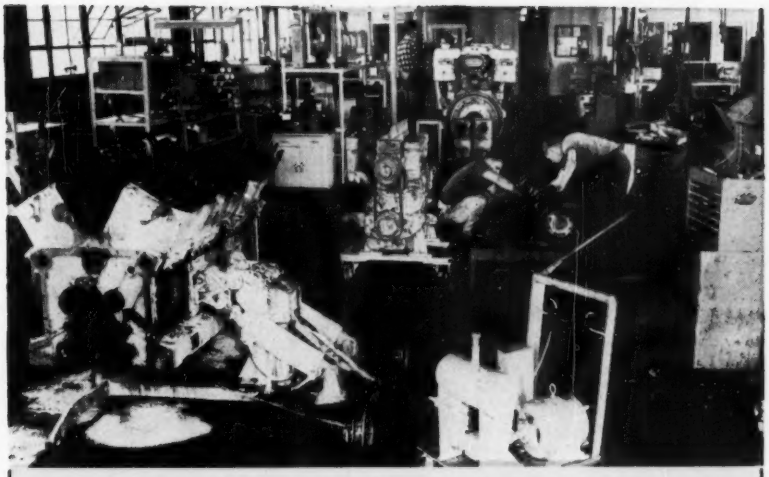
Can You Afford to Rebuild Your Engine Yourself?



HERE ARE TYPICAL REBUILD PRICES FOR THE MOST POPULAR CAT ENGINES

D311 . . . (D2, #212 MOTOR GRADER, 933, 11A) . . .	$ 995
D313 . . . (D4, #112 MOTOR GRADER, 995, 12A) . . .	1,395
D318 . . . (D6, #12 MOTOR GRADER, 977, 20A) . . .	1,650
D337 . . . (DW21	2,550
D339 . . . (D88000, D7 – 3T, 17A)	1,995
D342 . . . (D13000, D8 – 1H, 2U, 13A, 14A 15A)	2,350
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D375	4,975
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Can you afford the down-time and additional costs of rebuilding your Caterpillar diesel engine yourself when Beckwith is now able to do the job in *hours?* Another advantage of turning over your Cat engine rebuilding to our factory-trained specialists is that you know, before a nut is turned, exactly what the finished job will cost. Firm prices are quoted on each engine model.

We will also make arrangements for a specially equipped truck to help you remove your power unit at slight additional cost, if you wish, and speed it to our Engine Rebuilding Center. Speedy removal, transportation, rebuilding and installation of the rebuilt engine have all been planned to give unequalled service.

If your needs are critical, we may be able to improve on our time schedule of 48 to 72 Downtime-Hours* from pick-up to reinstallation. You'll like our prices, too. Fill out the coupon at left and we'll give you a call immediately. Or . . . pick up the phone and contact your nearest Beckwith Service Manager for more information.

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WE HAVE A CATERPILLAR D _____ ENGINE, SERIAL _____ IN A _____

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Do You Know?

● Our age is greater than you think.

Our times show all the elements that, in looking back, "distinguished a great age," Dr. Caryl P. Haskins, president of Carnegie Institution of Washington, declared in his annual report.

Our time resembles earlier dynamic and critical eras, he declared. It shows the same sense of new physical frontiers close at hand, the same ferment of new ideas, and the same new and violent demands upon political and social organization.

Periods of great intellectual and technical achievement, such as the present one, are characteristically accompanied by grave uncertainty and questioning, Dr. Haskins said, adding:

"Our age may be considered typical of the most significant eras of change since the fall of the Roman Empire."

Dr. Haskins charged that major tasks for the coming years will be to find means to adjust to the "new powers, new values and new challenges and requirements" while preserving intact the fundamental values and characteristics of our society.

In science during the past year, Dr. Haskins reported, the most distant astronomical object thus far discovered was photographed with the 200-inch Hale telescope atop Mt. Palomar. It is a cluster of galaxies apparently receding from the earth at the unprecedented rate of 138,000 kilometers (82,800 miles) per second, about half the speed of light. Although its precise distance away is not determined, it is several billion light years.

At the Carnegie Institution's Geophysical Laboratory, at Washington, experiments suggested that the sharp transition in rock composition at a depth of 400 kilometers (240 miles) below the earth's surface is partly due to a change from one mineral form to another. Using high temperatures and pressures of 60,000 to 80,000 atmospheres, Carnegie scientists changed the iron olivine fayalite into a dense spinel form. Since olivines are widely distributed in the earth's crust and mantle, a transition from natural olivine to spinel may account for the change in rock composition.

Diamonds were synthesized by use of high temperature and high pressure at the Geophysical Laboratory, an accomplishment of only a few laboratories.

Dr. Haskins reported that in the fields of biology, the joint interests and methods of several non-biological disciplines are now influencing research. Physicists and chemists have joined their knowledge and their methods with those of biologists and medical research workers.

HERE AND THERE IN THE COAL INDUSTRY

G. A. Shoemaker

Raymond E. Salvati

Harry LaViers

F. Stillman Elfred

● Four top executives of bituminous coal producing companies, all directors of the National Coal Association, have been appointed to represent the coal industry on the advisory committee to the Office of Coal Research, established by Congress this year in the Department of Interior. They are, left to right, G. A. Shoemaker, president of Consolidation Coal Co., Pittsburgh, Pa.; Raymond E. Salvati, president of Island Creek Coal Co., Huntington, W. Va.; Harry LaViers, president of South-East Coal Co., Paintsville, Ky.; and F. Stillman Elfred, chairman of the board of Peabody Coal Co., St. Louis, Mo.

● The new Board members of The Nation Coal Assn. are C. B. Lakin of Philadelphia, executive vice president of The Berwind-White Coal Mining Co., and Arnold E. Lamm, president of The Pittsburgh & Midway Coal Mining Co., Pittsburg, Kans.

Mr. Lakin fills the vacany created by the retirement of William H. Ritter, who was president of Reitz Coal Co., Windber, Pa., until management of the firm was taken over recently by Berwind-White. Mr. Lakin joined Berwind-White in 1932 after receiving a master's degree from Harvard. After serving in World War II, he returned to the firm, becoming a vice president in 1956 and being elected executive vice president this year.

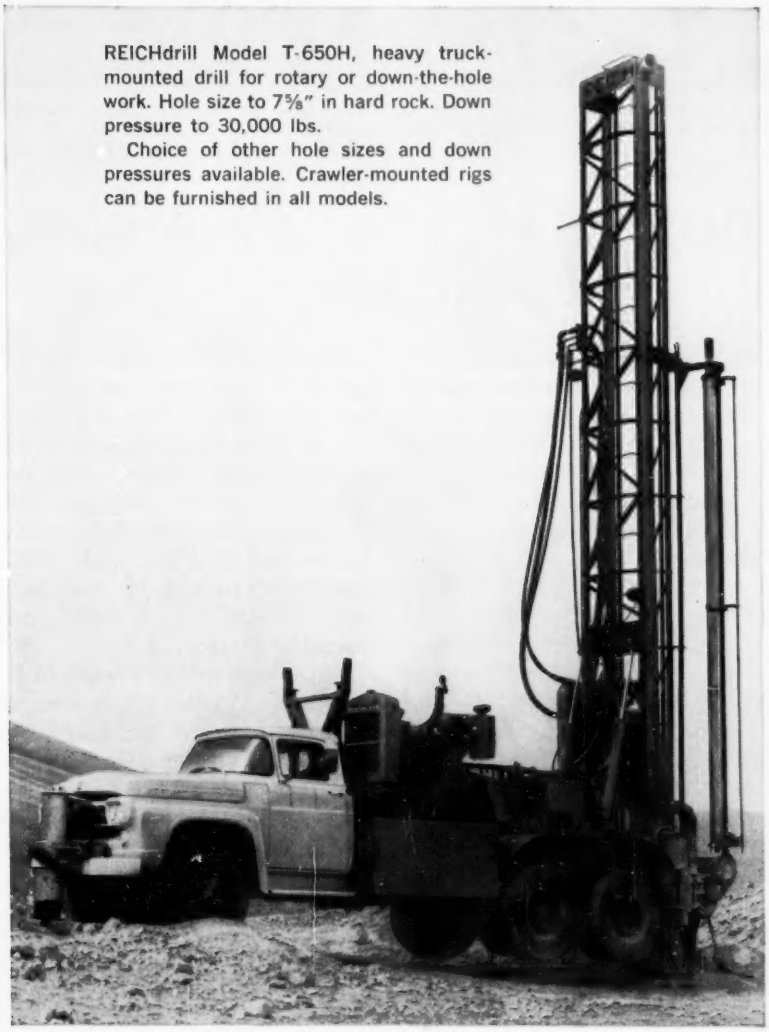
Mr. Lamm succeeds to the directorship formerly held by E. R. Phelps, his predecessor as president of Pittsburg & Midway. Mr. Lamm entered the coal industry in 1936 as comptroller for The United Electric Coal Companies, Chicago, later becoming secretary-treasurer of the firm. He joined Sunnyhill Coal Co. in 1946 and later became president and a principal owner. He became president of Pittsburg & Midway this year.

● The appointment of Clinton C. Cornelius as executive vice president of Emerald Coal and Coke Company, a J. H. Hillman & Sons Company subsidiary, was annaunoced effective November 1st. Mr. Cornelius had been vice president of engineering of Emerald Coal and Coke Company. He had formerly been located at Salt Lake City, Utah, as general manager for the United States Fuel Company. Prior to that time he was with the Baton Coal Company of Pittsburgh successively as assistant chief engineer, general superintendent and vice president of operations. Before that, he was employed by the Pittsburgh Coal Company.

A native of Pennsylvania, Mr. Cornelius was born at Pen Argyl. He graduated from Pennsylvania State University in 1940 as a mining engineer and also attended Rensselaer Polytechnic Institute.

WHEN YOU RUN A **REICHDRILL** YOU'VE GOT A RIG THAT IS **ALL-HYDRAULIC** AND FEATURES **TOP-DRIVE**

Drillers get "more hole per hour with a REICHdrill" because . . .



REICHdrill Model T-650H, heavy truck-mounted drill for rotary or down-the-hole work. Hole size to 7⅝" in hard rock. Down pressure to 30,000 lbs.

Choice of other hole sizes and down pressures available. Crawler-mounted rigs can be furnished in all models.

ALL-HYDRAULIC TOP-DRIVE MEANS:

1. **Infinitely variable speed** of drill rotation from zero rpm to maximum rated speed of model—permits the right rotational speed for every formation.

2. **Safety torque release** which practically eliminates all chance of drill breakage . . . protects all drive components.

3. **Direct-drive to drill stem** eliminating power loss . . . no complicated transmission to wear or maintain . . . no rotary table.

4. **In and out of the hole faster** because no kelly bar is required.

5. **Operator can drill up as well as down** should bit become stuck.

And the REICHdrill offers these outstanding advantages: Dependable heavy duty CP Compressors supply plenty of air to suit demand . . . Fast-acting, ram-type hydraulic levelling jacks . . . CP "Air-Blast" Bits give you extra footage in the toughest formations . . . Angle drilling—operator simply sets correct angle and drills.

Prove it on YOUR OWN WORK. We're GLAD to demonstrate! If the REICHdrill doesn't **out-drill any other rig you may have** — pound for pound of weight, and dollar for dollar of investment, we won't expect you to be interested. Write, wire or phone —

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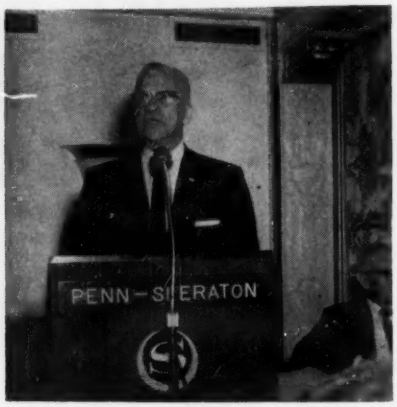
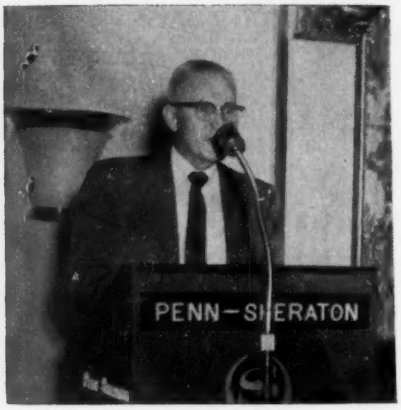
Find out the Extra Profit you'll make with a REICHdrill

G. O. Tarleton, Pres. Pittsburgh Coal Co. was Toastmaster at the Banquet.



W. E. Hess, Mgr. Mines Jones & Laughlin Steel Corp. and retiring Pres. addressing the Banquet.



W. Dan Walker, Jr. Dist. Supervisor, Bureau of Mines and incoming Pres. of the Institute addressing the Banquet.

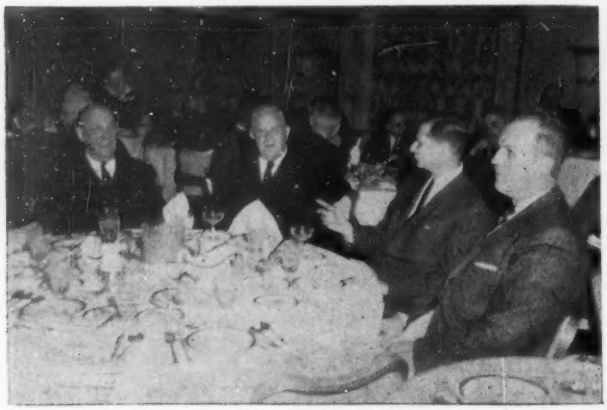
Seventy-fourth Meeting Of The Coal Mining Institute Of America

The 74th Annual Meeting of the Coal Mining Institute of America was held at the Penn-Sheraton Hotel, Pittsburgh, Pennsylvania, December 15 and 16. The purpose of this institute is to foster the increase and diffusion of knowledge relating to Coal Mining, to encourage education in practical and scientific mining, to promote study and research into mining problems and to advance the mutual interest of its membership.

The inseption of this Institute, 74 years ago, was no doubt inspired by man's long upward struggle through eons of time. Thirst for knowledge to keep abreast of the times, now, like in the past has coal mining man seeking better ways of fitting into natures scheme of changing things. In this struggle for knowledge present coal mining man is allowing unanimity of opinion confuse his unity of purpose. Irretrievable time has already been lost, so changes in production methods have got to be rapid and severe if the industry hopes to meet competition. Cultural status must be considerably accelerated. While it may be true that rapid changes can be extremely disruptive in social force; it is also true that rapid changes in mining coal are mandatory and are inescapable. Lost time has got to be regained.

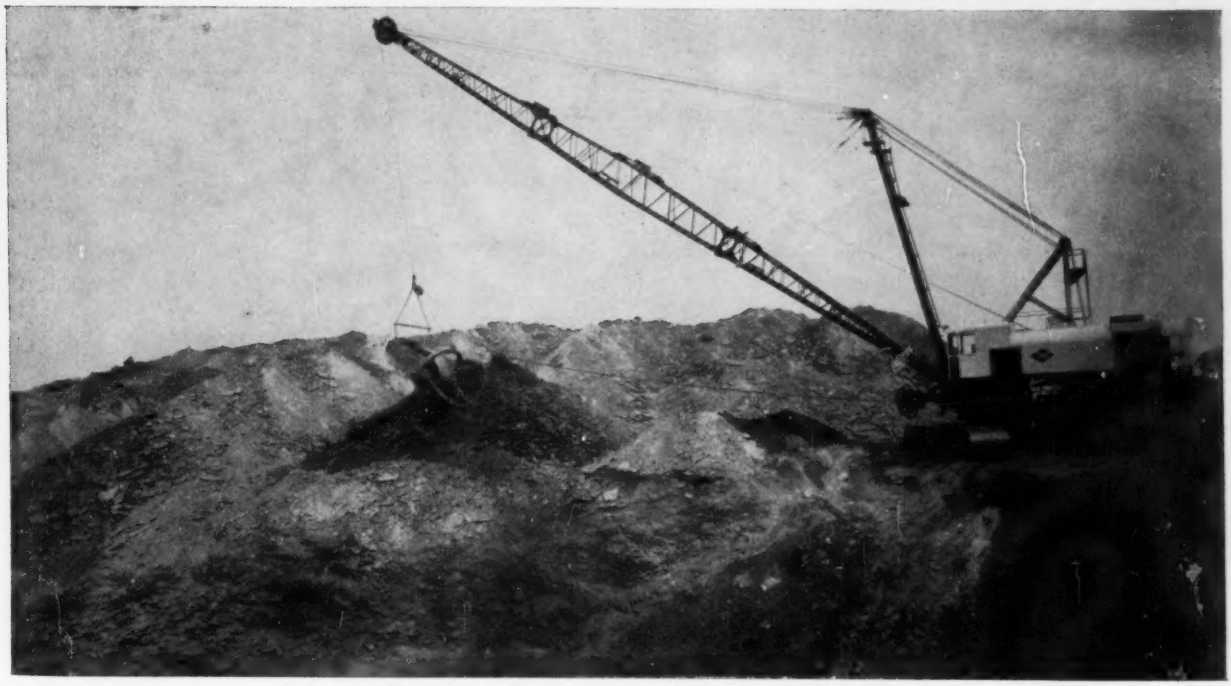
New things take "getting used to," and in industry normally are applied gradually. The most pressing requisite in mining coal is automation which should have been started at least 15 years ago. Automation requires a knowledge of electronics and its allied fields. Today, knowledge (education) means not only literacy but, to large degree, scientific literacy.

Those who intend to stay in coal mining and endeavour to save the industry have got to verse themselves in electronics. Organizations like the Coal Mining Institute of America have got to carry out the intent ond purpose of their inseption.



Left: W. L. Affelder, Pres. Emerald Coal & Coke Co. George H. Deike, Sr. Chairman of the Board, Mine Safety Appliances Co. C. C. Cornelius, Engineer, Emerald Coal & Coke Co., P. Bertus, Allegheny Pittsburgh Coal Co.

Wm. Kebblish, Mathies Coal Co., Wm. Jenkins, Leslie Black, Walter Japp, Pittsburgh Coal Co.; Max Florjancic, Gene Ruttle, Mike Rocco, Angelo Toci, Mathies Coal Co.



Lima Model 2400 dragline stripping overburden.

Hansel Coal Company Uses Late Type Equipment

The Hansel Coal Company's latest operation lies South of Osceola Mills in Clearfield County, Pennsylvania. The Miller "B" seam of coal running an average of 18 inches thick is being stripped. Cover consists of brown shale and an average of 45 feet is being moved with a Lima 2400 dragline and 7 yard bucket.

The coal is loaded with a new Model 405 Koehring shovel and 1¼ yard dipper. A Caterpillar D-8 tractor does grading before the dragline as well as other duties round the mine.

Koehring Model 405 shovel loading out coal.

Uncovered portion of the seam of coal.

Allis-Chalmers HD-21 clears way for shovel at Shawville Coal Company, Inc., Shawville, Pa.

Shawville Coal Company looks to the future with equipment from Highway

Lima 2400 strips overburden for Shawville Coal.

Shawville Coal Company, Inc., Shawville, knows that its future success depends on using the most modern equipment. So, like other progressive mine operators, it depends on equipment sold, serviced and guaranteed by Highway.

If you, too, are looking to the future, call your Highway representative today. A-3754A

Lima 44 loads coal.

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Allis-Chalmers • Master • Lima • Thor • Heltzel • Gar Wood
Jaeger • Buffalo-Springfield • Lippmann Crushers
Rogers Trailers

Keys To Profitable Purchasing Specifications

by Ernest W. Fair

One of the foremost areas in which profits can be increased in many a coal producing firm is in the exercise of better planning and execution of purchasing orders as well as simple requisitions for materials, supplies or equipment.

Complete avoidance of errors which are always costly in any business, elimination of production time loss through failure of material to arrive on time, assurance of the right item being delivered at the proper time and many other results ensue. All are cost reducers and profit savers.

The primary step in improving such purchase orders in any coal company organization is in making certain each and every one down to that involving the smallest sum are backed with detailed knowledge concerning the item being purchased. With this should go painstaking care in filling out such orders and requisitions for an error on the part of even a stenographer involved in writing it up can result in loss in many forms.

Close attention to concentration on details and requirements of every single order is frequently mentioned as an area wherein the average firm can secure cost savings. This is most prevalent in smaller firms working with less skilled and more harried staffs.

It is next important that every such purchase order possess completeness. The completer detail and specification the greater assurance the firm has of prompt delivery of exactly the item or items needed from the supplier. And where specifications are calling for bids we can have assurance of lower prices where the specification itself is thorough and complete and the bidder thus has to take into account fewer speculative angles in his bid.

One firm noted for high efficiency in this business division of its operation requires a specific check by the executive involved on every single order for the following points:

(a) Does the order accomplish what it is intended to do in every detail or is there vital information lacking therefrom?

(b) Is this order free of error?

(c) Is it clear and concise and free of any ambiquity which may lead to misunderstanding?

These three points are particularly important for the average order by any firm involves legal problems should something go amiss since purchase orders have been established as contract documents. Keeping this point in mind on every such order will be a virtual assurance of more exacting detail therein on the part of all company personnel involved.

From this viewpoint it should be kept in mind that every such purchase order be written for the benefit of both the other party involved and the firm itself. They must be mandatory, reasonable, simple, clear and complete, as legal requirements.

They must also include accurate and detailed descriptions of materials or equipment involved. Itemized orders for materials are always well worth whatever extra effort it takes to draw them up and write them into the purchase specifications. Descriptions of the materials should always be presented in material terms only.

From the standpoint of writing it is also wise to place emphasis on complete analysis as a requirement of a good purchase order. Segregation of items according to a definite system should be a part of the good writing chore. It is never wise procedure to take refuge in blank clauses or attempt to throw individual responsibility on the supplier regardless of the type or size of any purchase order.

Details in these orders have the well worthwhile advantage of assuring against unsatisfactory results and where bids are involved they can always secure lower figures.

Clear English writing is an absolute essential of every good purchase order. The use of simple language not only makes the order easier understood by everyone who must handle it but helps to secure desired accuracy in every statement therein. Using short sentences with clear, correct and concise English is another must of a good purchase order which keeps general costs down in the coal company operation. Avoidance of long words, long sentences and long paragraphs wherever possible to do so reduces the margins for mistakes and errors even further.

Every good purchase order should contain the address, the correct name of the firm and all addresses of the parties concerned with the order. It should also show how, when and where the supplies, materials or equipment are to be shipped and also the terms of payment.

Another good procedure is to always indicate whether the prices quotes are firm or estimated prices. This avoids one of the most prevalent causes of misunderstandings and disputes insofar as the average purchase order is concerned.

It is always best, in even the very smallest such order, to definitely name the catalog selection and definitely quote from it. This is a further step toward avoiding mistakes and confusion and makes routing and checking both in the supplier's and one's own firm simpler and surer.

However, it is always wisest this is done not to use it as a shortcut but to include quantity and complete description of the item or items ordered in all phases.

CATERPILLAR

Where replacement or repair of a certain equipment part may be involved many headaches can be saved by making certain the specifications show the full part number, its location and association with adjoining members, the serial and/or model number of the major machine and any other specific data which can lead to assurance there will be no mix-up or mistakes in delivery at the earliest possible moment.

It is always best to make certain that the specialist in charge of the particular supplies, materials involved in any given purchase order supply descriptions on highly technical items. It is also wise to have this individual check the actual order before it is sent out.

● Motorola has expanded its two-way radio base station line with new desk-top and high powered models.

Called the Consolette station, the new table top unit is designed for easy installation on a desk without taking up valuable space. It is only 15 inches long, 18 inches wide and less than 9 inches high. The new unit weighs under 40 pounds.

Dispatcher, at new table top base station, radios message to enroute driver in vehicle.

Stressing style, the slim unit blends well with the decor of any office. It is ideal for use by business, industrial or government organizations to communicate with vehicles in plants or away from the office, or with persons carrying Motorola "Handie-Talkie" Portable Radiophones. The Consolette station can also be utilized with the Motorola personal radio paging system which enables selective one-way voice communications to more than 7,500 persons.

The Consolette station provides 25 watts power output when utilized with systems operating on high band (144-174 mc) frequencies, and 30 watts when used on low band (25-54 mc) frequencies.

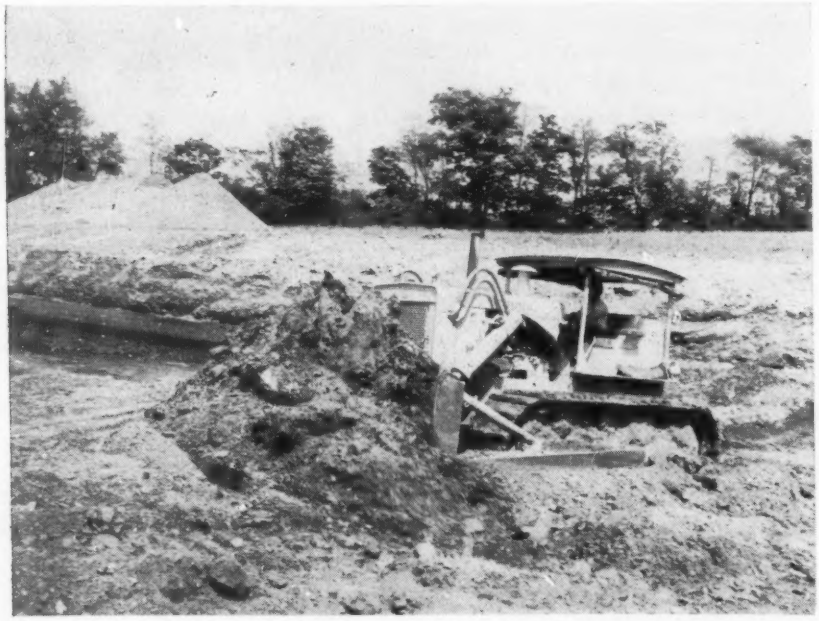
A clock and built-in meter are available with the new Consolette station. Any standard desk-stand and hangup microphone or handset can be utilized.

Motorola's new high powered station utilizes a 300-watt transmitter making it the highest powered unit in the company's standard line.

Designed for operation in the 25-24mc frequency band, the new base station can be used in conjunction with any Motorola two-way mobile or portable unit. The greater punch is designed to extend coverage to fringe areas.

Cabinet radiation is reduced in the new unit through the incorporation of a shielded amplifier. This feature reduces possibility of interference for sensitive television receivers, FM radios and other electronic equipments being operated in the area. For optimum safety, tuning controls are accessible from the front of the amplifier.

Standard squelch and Motorola "Private-Line" Dual Squelch models are included in both of the new base station lines.

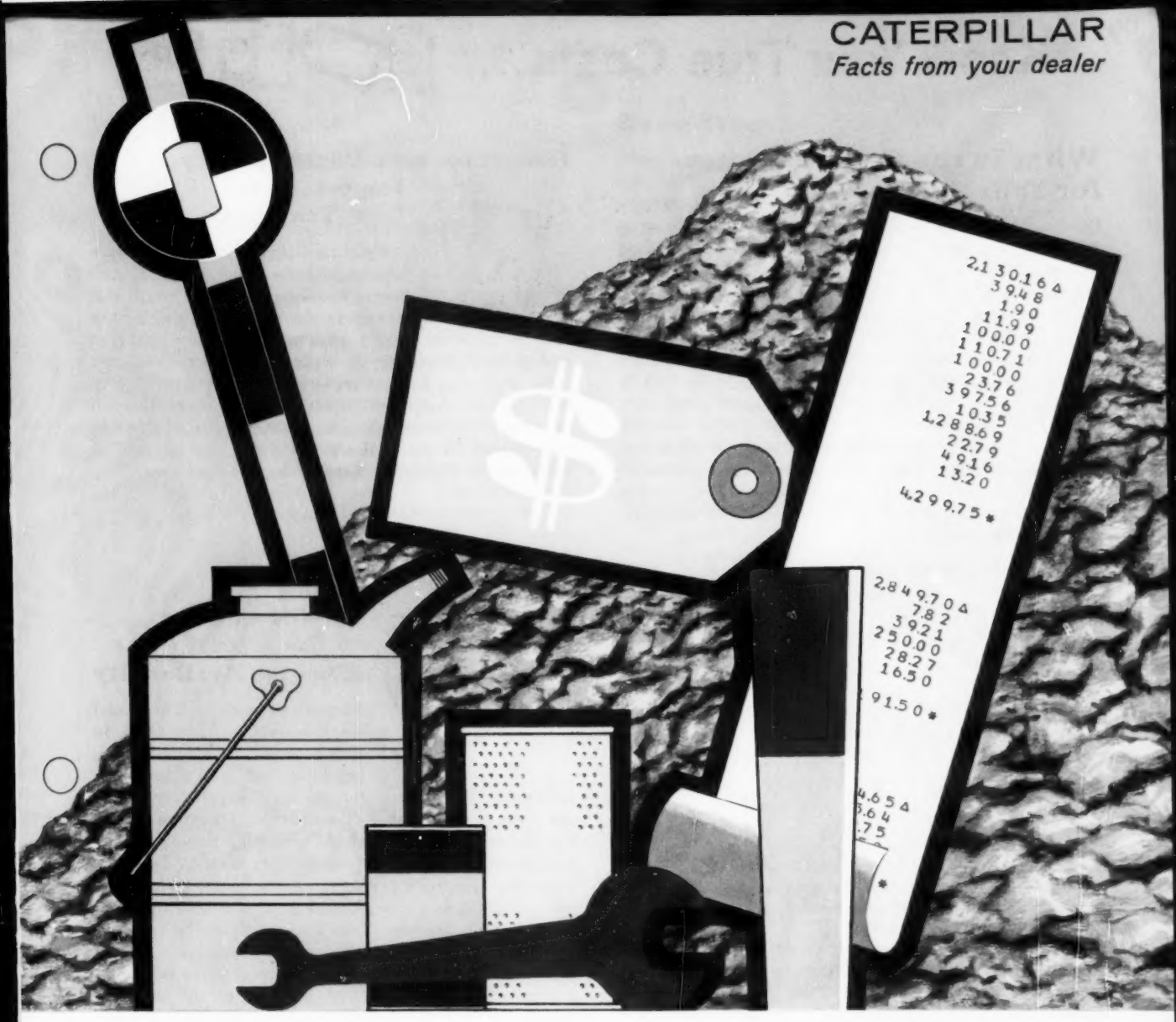


Sixty-foot-wide cut is made in earth and soft shale mixture by International TD-25 near Berlin, Pa., where Croner, Inc., is stripping 12-foot overburden layer to uncover 16-inch seam of Pennsylvania No. 1 bituminous coal. Operating principally in Somerset County, the Croner organization ships the fuel to domestic and steam markets. In some sectors, the overburden runs 40 feet deep, with seams as deep as 46 inches.

● John W. Scales of Indianapolis was reelected president of the Indiana Coal Association at its annual meeting in Terre Haute. Mr. Scales is associated with the Enos Coal Division of Pickands Mather & Co. The representatives of member Hoosier coal companies named L. B. Girard, vice president of Peabody Coal Co., vice president, and reelected L. E. "Buck" Sawyer secretary-treasurer and manager.

Executive committee members named, in addition to the president and vice president, are: David Ingle, Jr., president, Ingle Coal Corp.; W. G. Stockton, vice president-sales, Indiana Division, Walter Bledsoe & Co.; Henry Smith, president, Princeton Mining Co.; Roy E. Dean, vice president, Ayrshire Collieries Corp.; W. J. Crawford, vice president, Enos Coal Mining Co.; and Paul B. Clayton, superintendent, Shasta Coal Co.

CATERPILLAR
Facts from your dealer



What are TRUE MACHINE COSTS??

Initial price? That's part of the story, but it's only the beginning . . . it's merely the first cost.

▸▸ How about owning and operating costs such as depreciation, interest, insurance, taxes, fuel, lubricants and repairs? And how about the cost of down time . . . production lost because of unscheduled repairs? As you can see there are many variables, but only by knowing all these costs can you measure a machine's true worth.

The price tag is only the first cost. Trade-in deals, special discounts and unusual terms may disguise the facts. To estimate *true* costs, let's investigate the facts on the following pages.

Know Your True Costs...

What Is the Best Machine for Your Job?

Obviously, the best machine for your job is the one that will meet your production requirements with the lowest true cost. A demonstration is a good starting place as it will show some of the factors of *new* machine performance —but, to show them accurately takes more than a stop watch and an estimate-the-load demonstration. Loads should be accurately weighed—we can provide portable scales. Owning and operating costs should be clearly established—we will help you estimate these costs.

Here's an example of how one contractor selected equipment on the basis of lowest *true* cost: On a side-by-side demonstration, a Cat 619 Series B Tractor-Scraper proved to be a far more practical investment than another more powerfully rated and costlier rig. The following chart tells the story.

JOB CONDITIONS: Material: Clay, 3,000 lb./bcy
Haul: 3,000 ft., 3% favorable

	CAT 619	OTHER MACHINE	
	Pushloaded	Pushloaded	Self-loaded
Ave. Load Time (Min.)	.24	.48	.95
Ave. Cycle Time (Min.)	5.10	5.78	6.25
Trips/Hr.	11.8	10.4	9.6
Ave. Weighed Load (bcy)	12.1	13.9	10.5
Ave. Hourly Production (100% Efficiency)	**143**	**145**	**101**
Owning & Operating Costs*	$17.07	$20.76	$16.83
Load & Haul Cost/yd.	**11.9¢**	**14.3¢**	**16.7¢**

*All machine costs, including operator and pusher where applicable, computed by same method. They will vary with operating conditions and locale.

An analysis of performance shows that when both machines were pushloaded, the competitive machine moved slightly more yardage than the 619—about 2 more yards per hour. Even with twice the loading time the competitive unit was able to add only 1.8 yd. more to each load. Yet, *because of the higher owning and operating costs of the other unit*, the 619 moved the material for 2.4¢ less per yard.

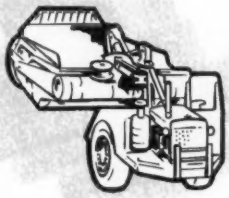
The competitive unit is promoted as a satisfactory self-loader, which it may be under ideal conditions. But, when attempting to self-load under these typical conditions, production dropped rapidly. In this comparison, the less expensive 619 and the Cat D9 Tractor-pusher moved 41.6% more yards at 40.3% less cost per yard than the other unit.

Here are some of the reasons for the 619's ability to move dirt at lower cost per yard: The matched Cat LOWBOWL Scraper (14 cu. yd. struck, 18 cu. yd. heaped) takes less loading power, packs in full loads faster for more production. This faster loadability is reflected in minimum time in the cut, maximum efficiency of the pusher-tractor, and a full, well-packed load.

The 619 moved its load slightly faster, too, despite 32% less horsepower . . . the direct result of better roadability and faster usable speeds. The Cat machine hugs the ground, has plenty of speed, and the safe "feel" that encourages operators to take full advantage of that speed.

Long Life and Dependability... Important to Low True Cost

A short term demonstration indicates what machines can do—while they are new. However, allowance must also be made for proved dependability and performance . . . the kind you find in Caterpillar-built products. It is no secret that over 90% of all Cat Motor Graders ever built are still producing—that many Cat track-type Tractors are still hard at work after thousands of service hours—that the first Cat Diesel Tractor—almost 30 years old—is still at work. Every Caterpillar product has this pedigree.



Another Factor to Consider... Machine Availability

Demonstration results are based on the assumption that no down time exists—that both machines are available 100% of the time. This is usually true on a demonstration but not over a long period of operation. Therefore, if the results are to be considered realistic, they must be tempered with estimated availability factors. Let's assume that the 619's performance can be calculated on a 90% availability factor, for example, and that the competitive unit, because of its design, would be rated at 5% less. Projected over 2,000 working hours (long before the 619 needs major repairs) production for both machines, pushloaded, is about equal. But, the cost-per-yard difference has increased to 3.6¢—now 16.9¢ for the other machine against 13.3¢ for the 619, as the chart reveals. By attempting to reduce costs through eliminating the expense of a pusher-tractor, the competitive unit's production dropped well below the 619's, while cost-per-yard climbed to 19.6¢.

2,000 Working Hours

	CAT 619 90% Availability	OTHER MACHINE 85% Availability	
	Pushloaded	Pushloaded	Self-loaded
Production (bcy)	**257,400**	**246,500**	**171,700**
Total Owning & Operating Costs	$34,140	$41,520	$33,660
Load & Haul Cost/yd.	**13.3¢**	**16.9¢**	**19.6¢**
Three-Scraper Fleet on 100,000 Yd. Project (10-hour day)			
Days to Complete	**26**	**27**	**39**
Load & Haul Costs	$13,300	$16,900	$19,600
Extra Cost		$ 3,600	$ 6,300

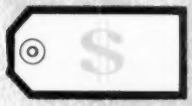
Availability *(continued)*

Apply these same figures over a 100,000 yard job, using several machines, and you can see where savings with the Caterpillar unit can add up to thousands of dollars. For example, if each fleet consisted of three tractor-scrapers and a D9 pusher, both fleets could complete the job in about the same number of working days. But, to do the job with the other machines would have cost $3,600 more because of higher owning and operating costs. And, in addition, the contractor would have invested initially nearly as much in just these three competitive hauling units as in three 619s *and a pusher!*

If he attempted to eliminate the pusher-tractor from the fleet, he would need 13 more days—50% longer—to complete the job. In addition it would cost $6,300 more (plus extra overhead) to finish the job later. For approximately the same initial investment, Caterpillar-built equipment would give more production, lower costs.

How to Figure True Costs on Your Job:

INITIAL COSTS + OPERATING COSTS + DOWN TIME − RESALE VALUE = TRUE COSTS



Initial Costs

When analyzing machines, it is important that you compare similar features. Is horsepower maximum or flywheel—rated with or without fan, water pump and other operating equipment? Does the manufacturer have a reputation for conservative or optimistic ratings? Is the scraper capacity rated struck or heaped—with or without sideboards? Is one machine loaded with options—and the other stripped? Do they compare in tire size—top speeds —extras—power steering, cabs, etc.? Does it have all of the labor-saving and cost-cutting design advantages you want? If the machines are not similarly equipped—make the necessary adjustments in your evaluation.

ADJUSTED PURCHASE PRICE OF MACHINE: $_____

Owning and Operating Costs

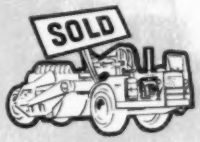
There are different ways to determine owning and operating costs. A demonstration, for example, will not only give an estimate of production but also of some of the operating costs such as fuel consumption while the machine is new. However, complete owning and operating costs usually have to be estimated. We will help you determine owning and operating costs. Your cost records, carefully kept on an individual machine basis, will give you the best specific cost factors to analyze. Using these, and other cost records from other owners, our equipment specialists can help you arrive at true costs on your job.

OWNING AND OPERATING COSTS: $_____

Down Time

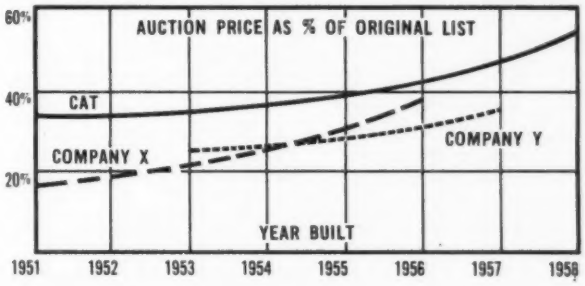
What does down time cost? Estimate what down time costs in terms of lost production, actual expense, nonproductive labor, or standby equipment. The cost of parts and labor for repairs is included in operating costs. But, lost production can be even more expensive. For example, in an actual job, two pushers worked side-by-side and got the scrapers out of the cut in about the same time. Their on-the-job productivity was the same. Yet, in 5 months, one pusher was down *one* hour, the other for 135 hours. These 135 hours cost this contractor more than $7,500 in lost production alone. How can you anticipate down time of a machine before you buy? Know its reputation. Consider our reputation for prompt service and parts availability. Cost records on Cat equipment tell the story.

MACHINE DOWN TIME (estimate lost production): $_____



Resale Value

What is the average resale value of tractor-scrapers after 10,000 service hours? We have a "blue book" of values showing the true worth of machines based on resale prices of all makes of used equipment across the country. From these sources, we find figures that positively prove Cat-built equipment retains its value longer. Using "blue book" prices of machines sold at 51 legitimate auctions in 19 states during 1959, here's how Cat wheel Tractors compared with two competitive manufacturers:



ESTIMATED MACHINE RESALE VALUE: $_____

Look at Last Costs First

True costs are not easy to come by—yet they must be known to evaluate equipment and find out if it is really making money. Or, if you are selecting new equipment, an analysis of true costs will help provide the yardstick of true worth. Use the formula: Initial costs + Operating costs + Down time costs − Resale value = True costs. Let us help you consider all of these factors, and apply them on your job. You'll prove to yourself that modern Cat Equipment, in its right application and backed by a Caterpillar Dealer, brings you the lowest true costs of all!

For cost facts that are true, see us
YOUR CATERPILLAR DEALER

Your Caterpillar Dealer adds up all the facts

First the Product

As your Caterpillar Dealer, we add another quality to Caterpillar equipment: it is the combination of personal, local responsibility; a thorough knowledge of the equipment best suited for your job; a deep interest in your success, and a desire to serve you. One of our responsibilities includes maintaining an ample stock of both new and used equipment for your inspection and selection.

+ Job Analysis

Our experienced earthmoving representatives are ready to help you analyze your job and equipment, recommend new procedures and most efficient equipment for your needs.

+ Financing

We provide personalized, liberal and sound financing plans to match your needs.

+ Parts

Every Cat-built machine in your spread is backed by a stock of genuine Cat Parts.

+ Service

Ready to go to work for you are experienced men and special equipment, on your job, or in our shop. It is our responsibility to keep your machines going.

A FEW BRIEF FACTS ABOUT THE CAT 619 TRACTOR-SCRAPER

Power—balanced to weight, speed. 225 HP at 2,000 RPM.

Cat-built Engine—designed specifically for the 619, plenty of surplus lugging ability, 4-cycle, turbocharged, valve-in-head.

90° follow-up steering—fully hydraulic.

Cable-operated control—fast, positive ejection, accurate spreading control.

NAME THE DATE—WE'LL DEMONSTRATE

The first step to cut your costs—to know your true costs—is up to you. Tell us when you want more facts backed by a demonstration.

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TIPS For Successful Ripping

(Information compiled by Market Division, Sales Development Department, Caterpillar Tractor Co.)

● Greater profit accrues to the tractor owner who makes a proper selection of ripper tips for his machine. What are the various conditions that dictate the type of tip to use? Here are some of the fundamentals for guidance:

The secret to ripping action is the tremendous force applied to the tip of the tooth by a 40 ton machine, twice that if a second tractor is used to push behind the tooth (tandem ripping). Because tip replacement is frequent on most jobs, it is important to recognize the differences in ripping conditions and choose the best tip for each job.

Following are three typical jobs where different ripping conditions required careful tip selection for maximum economy.

TIP A: (See Photo) A limestone quarry in a congested Midwest city replaced its costly and damaging blasting operation with ripping. The rock was extremely hard. Sometimes tandem ripping was necessary. Under these conditions strength was the most important factor in choosing the most economical tip. A high-strength forging of large proporations (4-in. point) was recommended. The extreme hardness encountered caused the tip to blunt after only 15% wear, and it was replaced to maintain good penetration. But great strength made this the best tip to use.

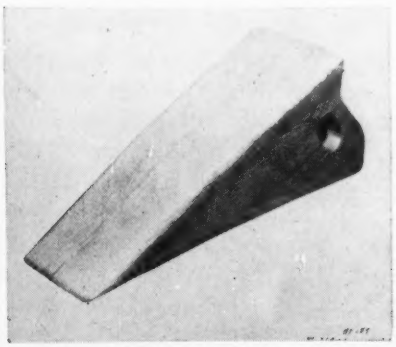
TIP B: (See Photo) A layer of sandstone overburden was being removed from a coal seam in Pennsylvania. Big tractors ripped and bulldozed the material faster and more efficiently than blasting and loading with draglines. In this case the ripping was not extremely difficult so a narrower tip was used for better penetration and fracturing. This tip is tapered to a 2½-in. point and is undercut for self-sharpening. Because of this feature the tip may be used until it has worn the entire point down to the shank cavity-30% of the metal in the tip.

TIP C: (See Photo) On a highway job in the Southwest, the contractor hit a section of decomposed sandstone. He had to break it up so the wheel tractor-scraper units could load and haul it away. Ripping this material was comparatively easy and was the obvious way to do the job. Fracturing was no problem but extreme abrasion caused a high wear rate on the tips. It was here that the tip and boot combination gave the most economical performance. The strength of a one piece tip was not needed and the small, inexpensive tip was replaced often without disturbing the boot. This tip tapers sharply from about 6" to 3" and can be half worn away before replacement.

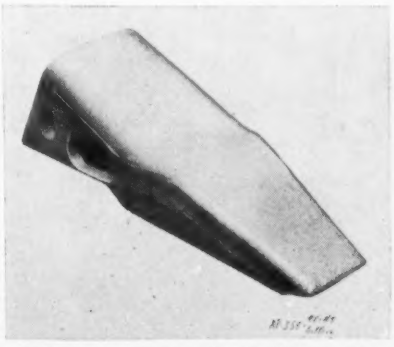
Chart I shows a summary of tips A, B and C as used in different materials. There is some overlap between tip applications; however, field tests show that the design of tip B makes it an excellent general purpose choice in a broad range of applications.

Although these three examples do not cover every ripping situation, they illustrate the wide range of general tip usage. Nor do they include every type of tip on the market today. In addition to variations on the above, there are tips combined with a mounted wedge or a wing dragged behind. This loosens a wider swath of material and in some conditions breaks it into smaller pieces. These tips will often increase production but in some material, especially more difficult ripping, production could be decreased if the tip is not adequate for the job.

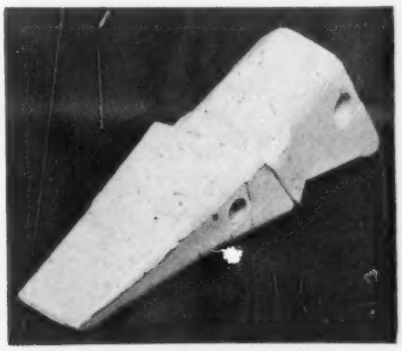
If maximum production in medium to hardripping is to be maintained, the importance of ripping angles cannot be overlooked. The ripping angle is the one formed between the top side of the tip and



TIP A. High strength tip — for use in extreme hardness conditions.



TIP B. Tapered point design — gives best results where fracturing and penetrating qualities are necessary.



TIP C. Tip and boot combination — for use in extremely abrasive conditions.

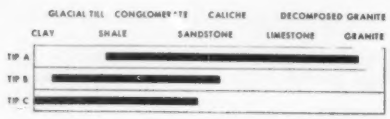


CHART I. This chart provides a guide to the type of tip to use in different hardness materials.

ground level. But again, variations in conditions prevent any one, single conclusion. Different materials, even the same type at different stages of decomposition, do not have similar optimum ripping angles. Test results show the most efficient ripping is done in a range between 40° and 50° angles.

These angles are determined by the clevis, or tooth mounting. There are two major types of clevis. The parallelogram mounting keeps the tooth at one angle, no matter what the depth of penetration. With the multi-position clevis, the angle varies with the tooth depth, thereby allowing a change of setting on the clevis to get the optimum angle for a certain material and depth.

As material increases in hardness, the depth of penetration becomes shallower but the ripping angle should always remain between 40° and 50°. Chart II summarizes the settings of a 5-position clevis, according to material hardness.

Big-tractor ripping is no longer in its infancy. It has already proved time after time to be a safer, more economical method of fracturing layers of natural rock. With its success has come more scientific analysis of the relationship between machine and material. Seismic analysis for example, makes it easy to determine valuable information on rippability.

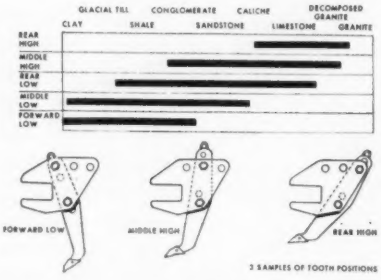


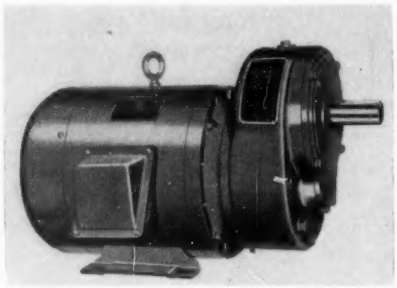
CHART II. The ripper tooth can be set at any one of five angles, the position being determined by the type and hardness of the material to be ripped.

Careful study of each set of conditions . . . material hardness and abrasion, required depth of penetration . . . will help determine machine size, tip selection and clevis position. Such conclusions are important to an efficient and profitable ripping operation.

Lima 1250 with Allis-Chalmers 21000 engine . . . P & N Coal Co. at Benezett pit.

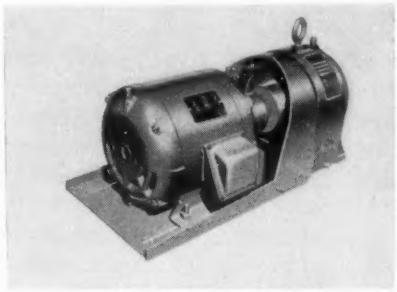
● A new 6-page bulletin describing its full line of gearmotors and "Line-O-Drive" coupled speed reducers is announced by Howell Electric Motors Company.

Gearmotors range from 1 to 150 hp., a.c.; single, double and triple reduction; with speeds as low as 7.5 rpm. They are available in AGMA Classes I, II and III; in open, enclosed and explosion-proof enclosures; with a wide variety of mountings; all NEMA standard start-run characteristics; either parallel shaft or right-angle drive (up to 30 hp.).



Howell single-reduction gearmotor.

Line-O-Drives described are from 1 to 75 hp., a.c., with output speeds as low as 1.2 rpm.; either flange or foot-mounted; open, enclosed and explosion-proof motors; standard NEMA starting torques.



Howell Line-O-Drive unit.

In addition to descriptive and performance data, two full pages of selection tables tabulate various output speeds for each horsepower rating in all three AGMA Classes.

The bulletin lists numerous typical applications but points out that uses are for any drive requiring "slower-than-motor" speeds.

Request Bulletin MD-1. Howell Electric Motors Company, Howell, Michigan.

Cat Announces Two New Power Shifted Wheel Tractor-Scrapers, Feature Exclusive Torque Divider, 420 Maximum HP., 21 Cu. Yd. Struck Capacity

● Two new, 420 maximum horsepower wheel tractor-scrapers, featuring an exclusive torque divider power shift transmission, have been announced by Caterpillar Tractor Co. The new machines are the four wheel 630 Series A and the two wheel 631 Series A.

Both tractors are powered by a completely new design, four-valve-in-head, diesel engine that has a maximum rating of 420 horsepower and a flywheel rating of 335 horsepower. The 630A has a top speed of 41 miles per hour and the 631A, 31 miles per hour. Other machine features include specially developed 28 ply 29.5 x 35 tires, "live" air actuated cable controls that reduce operator effort, advanced design steering systems for both units and a high degree of service accessibility.

Scrapers are of lowbowl design and have a struck capacity of 21 cubic yards and a heaped capacity of 28 cubic yards. Refinements to the basic Lowbowl concept permit corner voids to be filled without staying excessively long in the cut.

For extra-large production capabilities under special job conditions, a new unit, the 630A-482C Tractor Scraper combination, will be available. The new 482 Series C has a 35 cubic yard heaped capacity and 28 cubic yard struck. These units are designed specifically for easy loading material and long hauls without adverse grades.

A primary consideration in the design of the new tractor-scrapers was the matched development of the torque divider power shift transmission with the new D343 Diesel Engine.

To "shift," the operator need only move the selector lever to one of three speed range positions. Within each range, the most appropriate of three "drives" is automatically selected to meet changing power requirements. The transmission combines planetary gear routes with a torque converter. The three automatically selected drives are: torque divider drive, direct drive and overdrive.

Torque divider drive is the first selected in each speed range, sending 25 per cent of engine torque through the converter and 75 per cent directly to the power train. As travel speed increases, the unit shifts to direct drive and then to overdrive.

A dash-mounted indicator shows the operator when to shift to the next higher speed range. The automatic shifts again take place in the next higher range. Unique feature of this arrangement is its utilization of high torque multiplication when power needs are greatest, then automatic shifting to the more efficient direct drive and overdrive as conditions permit.

In order to obtain maximum rimpull during loading, the range selector lever can be placed in a special loading range position. This holds the transmission in torque divider drive, and permits matching scraper speed to the pusher throughout loading.

To best meet transmission power requirements, the diesel engine was designed to have two governor balance points. This "flattened-out" the horsepower curve and result in the engine developing a high level of horsepower at the time automatic shifts take place.

Individual porting of intake and exhaust valves is a special feature of the new Cat four-valve-in-head diesel engine. By connecting each valve directly to the manifold rather than in series, as is common in many four-valve-in-head designs, the engine's breathing characterists are greatly improved. Individual porting insures a maximum amount of air moving through intake valves and a more efficient exhaust.

Cooling of intake air further improves the engines performance. An aftercooler makes intake air more dense after passing through the turbo-charger. The denser air results in a greater amount of oxygen in the firing chamber. A pressure-ratio control system on the turbocharger permits delivery of maximum amounts of air over a wide range of engine lug.

Scrapers are operated by an air actuated, double drum cable control. The unit is driven by a live power shaft directly off the engine, providing full cable control whenever the engine is running. Cable control

With a heaped capacity of 35 cubic yeards, the 482 Series C Scraper is teamed with the new Caterpillar 630 Series A Tractor. The 482C is considered best suited for special job conditions with good loading material and well packed, long hauls with little adverse grade. The new 630A Tractor features torque divider power shift transmission and an all new 420 maximum horsepower, six cylinder diesel engine.

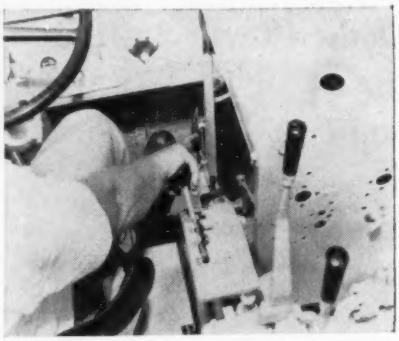
brakes have large capacity and precise modulation, resulting in more accurate scraper control, as a result of using 720 degree wrap brake bands. These are completely self-energizing.

The 631 Tractor-Scraper utilizes a full hydraulic, two-cylinder steering system with follow-up linkage that gives the operator realistic "feel" of the machine. Full 90 degree turns are made without cylinders reversing. Geometry of this cylinder design permits development of more force coming out of a turn than is developed going into a turn, which means operators can always turn out of any maneuver.

Steering gear of the 630 incorporates a hydraulic steering cylinder mounted in a protected position on the tractor frame and connected directly to the Pitman arm. This arrangement permits absorption of all road shock outside the steering gear rather than in the Pitman shaft. The 630 is easily handled in tight quarters because of a low, 13 to 1 steering ratio. New design tie rod ends automatically compensate for wear. Although primarily a hydraulic controlled system, a mechanical follow-up permits limited manual steering in case of hydraulic failure.

Tires for drive wheels and scrapers are tubeless, specially designed 29.5 x 35 with 28 ply rating. These tires were developed when design engineers forsaw that payload and tractor weights did not readily fit available tire sizes. Subsequent testing and analysis of such factors as diameter, capacity, weight and cost indicated the 29.5 x 35 to offer the most satisfactory combination.

One of two additions to Caterpillar Tractor Co. line of wheel tractor-scrapers is the 631 Series A Tractor-Scraper. The unit has a maximum horsepower of 420 and scraper has a struck capacity of 21 cubic yards. Exclusive feature of new machine is the torque divider power shift transmission.

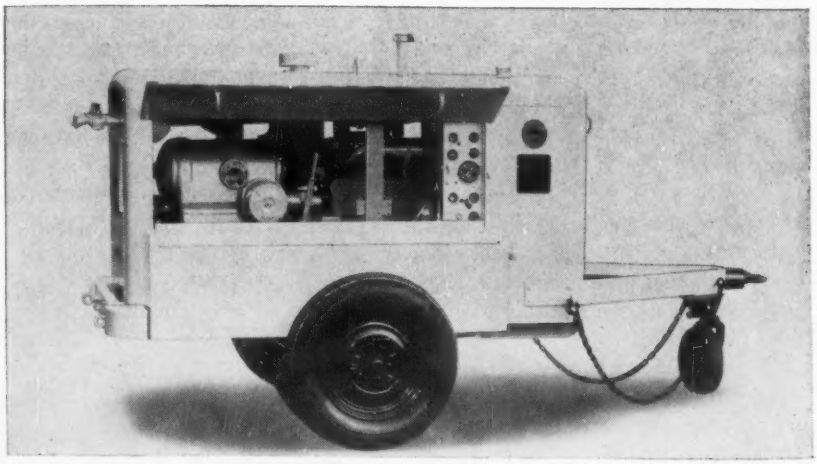


Torque divider power shift transmission on new Caterpillar 630A and 631A Tractor-Scrapers requires only flick of the wrist to select appropriate speed range. Exclusive torque divider feature automatically selects proper drive in each of three speed ranges, fits engine output to exactly meet load and material conditions.

Ease of serviceability was one of the prime design criteria for the new machine. Special attention was given to locating service points and making components readily accesible to facilitate ease of maintenance and repair. Oil pans of both tractors are removable without pulling the engine. All engine accessories can be repaired or replaced with the engine still mounted in the tractor. The 631 Tractor dash can be swung-out to give access to the starting engine, air compressor and water pump. Radiator, side plates and radiator fan are removable as a unit.

The engine can be removed with the torque divider transmission unit attached, permitting alignment prior to re-installation. The torque divider transmission unit can also be removed independent of the engine. The range transmission housing is attached to the rear of the tractor case and can be removed singly or as a unit with the differential carrier and cable control unit. Axles are removable by taking off final drive covers and the final drive can be pulled out without removing the wheel.

Among special features designed to improve operator comfort and efficiency are the fully adjustable Torsionflex seat, full width air vent located at the bottom of the windshield, steps on both sides of the tractors, convenient location of all controls and a generally uncluttered operator's compartment. Four headlights are provided for night operation.



● A new 125 c.f.m. diesel-powered 2-wheel rotary air compressor is announced by Davey Compressor Co., Kent, Ohio.

Known as Model 125 RPD, it is powered by a Hercules DD-198 engine. Outstanding features include Davey patented Perma-Vane Rotor blades, reputed to offer exceptionally long service life. Built-in double tool boxes,adjustable cooling shutters, and a centralized instrument panel with hour meter, are standard equipment.

The 2-wheel unit is 122 inches long, 65 inches wide and 63 inches high. Dry weight is 2790 lbs. For details, write DAVEY COMPRESSOR CO., Kent, Ohio.

● A new Electric Wheel powered scraper with a capacity rating of 30 tons has been announced as an addition to its "Pacemaker" line by R. G. LeTourneau, Inc., of Longview, Texas.

This Series L-28 **Electric Digger** is the first "small" machine to be manufactured by the Texas concern since it re-entered the earthmoving equipment business in 1958. Since that time the company has built its diesel-electric, all-wheel drive units only in tandem bowl machines for self-loading 50 to 130 tons.

By virtue of a 420 horsepower diesel-electric power plant and and driving wheels both "fore and aft", the Series L-28 is also a self-loading scraper in many types of material. Its manufacturer is not, however, billing it as a universal self loader such as the larger machines of the Pacemaker line. The difference is principally in tractive potential of four tires as opposed to eight on the larger machines.

The name **Electric Digger** is itself a reflection of the design philosophy behind the new earthmoving equipment now being manufactured by R. G. LeTourneau, Inc. Since the days of horse-drawn scoops dirt has been "scraped" into a bowl by application of an external force. Self-powered Electric Wheels, it is now claimed, give these bowls a "digging" faculty similar to a continuous crowd action on a shovel.

Perhaps the Series L-28's principal contribution to the development of earthmoving techniques will be the introduction of "shuttle" cycles between borrow and fill, according to R. L. LeTourneau, vice-president of the company. He explains that in "shuttle" operation the machine never turns around. It moves forward to dig, haul, and dump; moves back to get into digging position again. Electric Wheel drive offers the same power and speed in either direction, and the two-axle suspension with all-wheel drive makes forward or reverse steering equally easy.

To facilitate this type of operation, the L-28 is equipped with a rotating seat and control panel. Instead of turning the machine, the operator merely turns as he would in a swivel chair. A small control panel remains in front of him at all times.

● James F. Trotter of Morgantown was reelected president of the Northern West Virginia Coal Association. Also reelected were George R. Higinbotham, Mountaineer Coal Co., Stephen Canonico of Clinchfield Coal Co., and W. J. B. Mayo of Eastern Gas and Fuel Associates, vice presidents, and Truman E. Johnson, secretary-treasurer.

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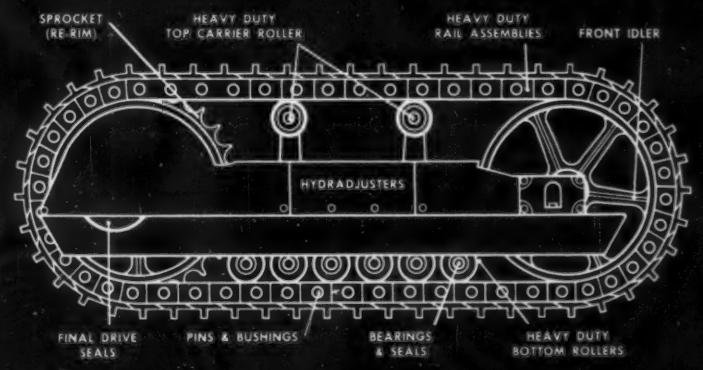

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Manitowoc Model 4500 Vicon-Control Dragline stripping the No. 5 seam

The No. 5 seam coal stripped, cleaned and ready to load.

Manitowoc Model 3,000 shovel loading coal into one of four Euclid End Dump Haulage trucks.

Late Type Machinery and Methods Used at Howe Coal Company

● Located in Tuscarawas County, near New Philadelphia, Ohio where coal beds are strippable, the Howe Coal Company is applying late type equipment to strip the Ohio Number 5 and 6 seams, running 24 to 36 inches for the number 5 and 27 to 42 inches for the number 6 seam.

Overburden consists of top soil and yellow shale that laminates as cover gets higher. The number 5

Lima Model 2400 Shovel stripping the No. 6 Seam.

(upper seam) coal is stripped with a Manitowoc Model 4500 Dragline with Vicon Control and a Monighan 5-W Dragline. Up to 95 feet of cover is moved off that seam. The number 6 seam is stripped by a Lima Model 2400 shovel. In area where conditions permit stripping both seams, up to 150 feet of cover will be moved.

The coal is loaded by a Manitowoc Model 3,000 shovel, into 22 ton Euclid End Dump trucks.

Coal lying under cover too high to strip is augered with a McCarthy Highwall Auger having 27 inch head.

The End Dump trucks unload into a hopper which feeds to a heavy density washing plant which handle sizes from 4 inch down to zero.

McCarthy Highwall Auger working in the No. 5 seam.

Over-all view of the Heavy Density washing plant which is washing 4 inch to zero.

● A daring new design concept in dump trailers now enables trailer owners to gain maximum axle-load allowances in all 50 states by hydraulically positioning the payload on an extra length trailer chassis.

Spencer-Safford Loadcraft, Inc., Augusta, Kansas, and Daybrook Hydraulic Division, Young Spring & Wire Corporation, Bowling Green, Ohio, jointly announce the manufacture of the Loadcraft-Daybrook "Hydra-Shift" PAY-PAC Dump Trailer. The unit attains maximum legal payloads in every state; enables operators to gain maximum load allowances authorized by various state weight laws; allows interstate operation without changing equipment or splitting loads; eliminates equipment obsolescence when weight laws change; permits ready interchangeability of tractors, single or tandem drive axle unit, has ground hugging stability throughout the dumping cycle.

The Hydra-Shift PAY-PAC uses a 4-section, telescopic double-acting hydraulic hoist to both position the 24-foot body on the extra-length chassis and to dump the payload. A single cylinder moves the PAY-PAC through its entire dumping cycle.

From its predetermined transport position, governed by local gross weight restrictions and number of axles carrying the payload, the body is hydraulically moved to the rear where it automatically locks for dumping. Smooth, continuous power on the hoist raises the body to its dump position. After the load is discharged, the body is returned to its forward transport station where it automatically locks into position.

PAY-PAC has extra stability because location of hoist on trailer length permits hoist to push almost straight up and hoist trunnion is lower than the trailer frame. The PAY-PAC keeps all wheels on the ground, dumping over the wheels throughout the cycle, for ground-hugging stability.

Reinforced understructure of the sliding body, manufactured by Daybrook, permits heavy impact loading. Sturdy cross-members at all stress points protects floor against rupture, stretch or buckle. All sections and joints are electrically welded for structural stamina.

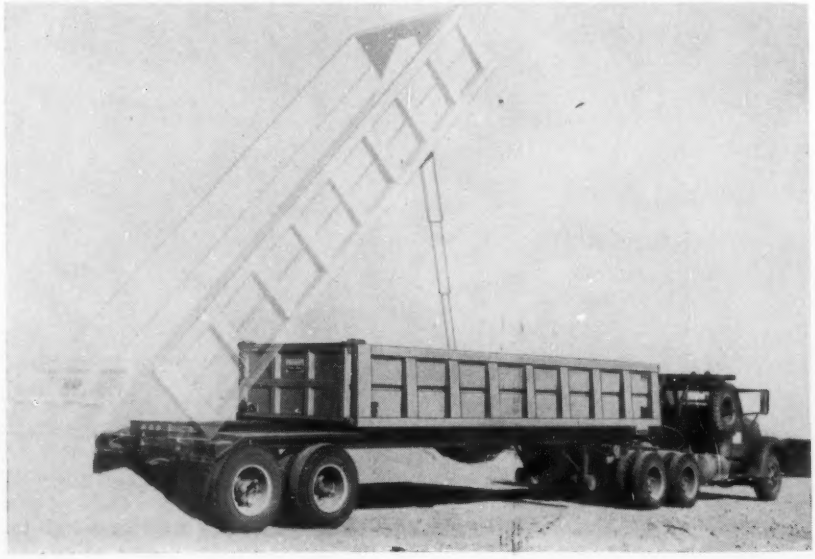
The 35-foot chassis subframe is fabricated by loadcraft of hi-tensile, lightweight steel for high payload capacity. The Spencer Tandem, an extra heavy-duty combination bar-spring tandem, puts flexing spring power under the load on the road. For heavy rugged off-highway work and heavy loads the bar equalizes and stabilizes the load.

To save tare vehicular weight aluminum air brakes are used to furnish instant braking and positive release action. Aluminum spiders and brake shoes offer superior heat dissipation and prolonged brake life.

The Spencer Tru-beam axle has extra depth and strength at center to reduce load deflection. Machined-in camber and toe-in gives equalized load to all tires.

The Loadcraft-Daybrook Hydra-Shift PAY-PAC, designed and patented by Loadcraft, is built to haul larger payloads and comply with maximum gross weight restrictions that cannot now be reached with conventional equipment.

For additional information write Spencer-Safford Loadcraft, Inc., Augusta, Kansas, or Daybrook Hydraulic Division, Young Spring & Wire Corp., Bowling Green, Ohio.



● R. Conrad Cooper, executive vice president of U. S. Steel, and associates representing 12 major steel companies met with David J McDonald and other officials of the Steelworkers Union. Speaking as co-chairman of their joint Human Relations Research Committee, Mr. Cooper urged the Union to seek ways of aiding a constructive program of attack upon steel unemployment at its two principal sources:

1. Antiquated tax laws which discourage private investment and make difficult the replacement of obsolete or inefficient equipment, not only in the steel industry but in other in other industries which are its customers, and

2. High costs which impair the companies' ability to compete with foreign steel producers and with producers of competitive materials.

Unemployment, of course, is of great concern to everyone, Mr. Cooper said, but the problem is by no means confined to the steel industry and must be approached in a broader way than just as a one-industry problem.

Steel employment is at low levels today not due to technological displacement, but primarily because the industry's customers are not, for the time being, ordering as much steel as before. Moreover they are buying steel abroad because of price advantage resulting in part from the great disparity between domestic and foreign wage rates. Materials of domestic origin are also becoming increasingly competitive.

ADVERTISER'S INDEX

JANUARY, 1961

Beckwith Machinery Company 2nd Cover, 2, 3, 11 to 14, 3rd Cover

Davey Compressor Co. ---------- 1

Highway Equipment Co. 1st Cover, 8, 4th Cover

Manitowoc Sales and Service Corp. ---------- 24

Maximon Machine Company, Inc. ---------- 19

Northeastern Incorporated ---------- 19

Ohio Machinery Co. ---------- 11 to 14

Salem Tool Company, The ---------- 23

Scottdale Machine, Foundry & Construction Co. ---------- 23

Swabb Equipment Co., Inc. ---------- 5, 23

Walker Machinery Co. ---------- 11 to 14

HEAVY EXCAVATION EQUIPMENT

Draglines, Shovels, Cranes, Drills, Trucks

15-W Bucyrus Erie Elec. Drag, 215', 12 yd.
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7-W Bucyrus Erie Diesel Drag, 140', 7 yd.
7400 Marion Diesel Drag, 175', 13 yd.
71-B B.E. Crane with 160' boom
625 Page Diesel Drag, 150', 10 yd.
1855 P & H Diesel Drag, 130', 10 yd.
621-S Page Diesel Drag, 125', 7 yd.
200-W Bucyrus-Erie Diesel Drag, 125', 6 yd.
2400 Lima Elec. Drag, 130', 6 yd.
2400 Lima Diesel Drag, 130', 6 yd.
4500 Manitowoc Drag, 120', 5 yd.
120-B Bucyrus-Erie Elec. Drag, 115', 5 yd.
111-M Marion Drag, 100', 4 yd.
1055 P & H Diesel Drag, 80', 4 yd.
1601 Lima, 4 yd., Shovel/Drag
3900, 3500 & 3000 Manitowoc Cranes
5560 Marion 26 yd. Elec. Shovel
5323 Marion 18 yd. Elec. Shovel
190-B B. E. 8 yd. Elec. Shovel
151-M Marion 7 yd. Elec. Shovel
1600 P & H 6 Yd. Elec. Shovels
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4161 Marion 6 yd. Elec. Shovel
2400 Lima 6 yd. Std. & H. L. Shovels
120-B B.E. & 4121 Marion 4 yd. Elec. Shovels
4500 Manitowoc 5 yd. H. L. Shovel
1055 P & H 3 yd. H. L. Shovel
1201 Lima 3½ Yd. Standard Shovel
111-M Marion Standard & H. L. Shovels
3500 Manitowoc Standard & H. L. Shovels
54-B Bucyrus-Erie Standard & H. L. Shovels
Model T-650 REICHdrill, Truck Mounted Rotary and Down-The-Hole
Ingersoll-Rand Truck Mtd. & Crawler Mtd. Drillmasters
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Euclid Trucks, Dozers, Attachments, etc.

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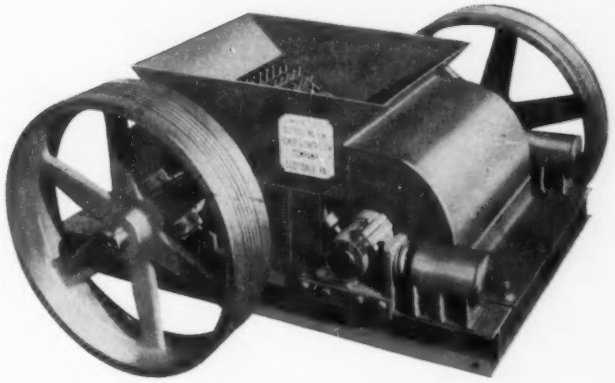
● George Shiffer McCaa, 76, inventor of an important mine safety device, died Nov. 28 in Pittsburgh. Mr. McCaa, founder of the National Mine Rescue Association, served the Bureau of Mines 14 years as inspector of European mine rescue procedures and invented the McCaa two-hour, self-contained breathing apparatus used in mine rescue and general firefighting. He was president of the Coal Mining Institute of America 1935-37 and retired in 1958 after 30 years as a state mine inspector. Mr. McCaa was an All-American football player at Lafayette College in 1908-09 and coached football at several Eastern colleges early in his career. He was the father of George W. McCaa, general manager, Hanna Coal Co., Moundsville, W. Va.

SCOTTDALE DOUBLE ROLL CRUSHERS



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Manitowoc dragline brings down 50 foot face of gravel . . . then re-handles the material by dredging 45 to 50 feet below water to supply Standard Slag Company washing plant.

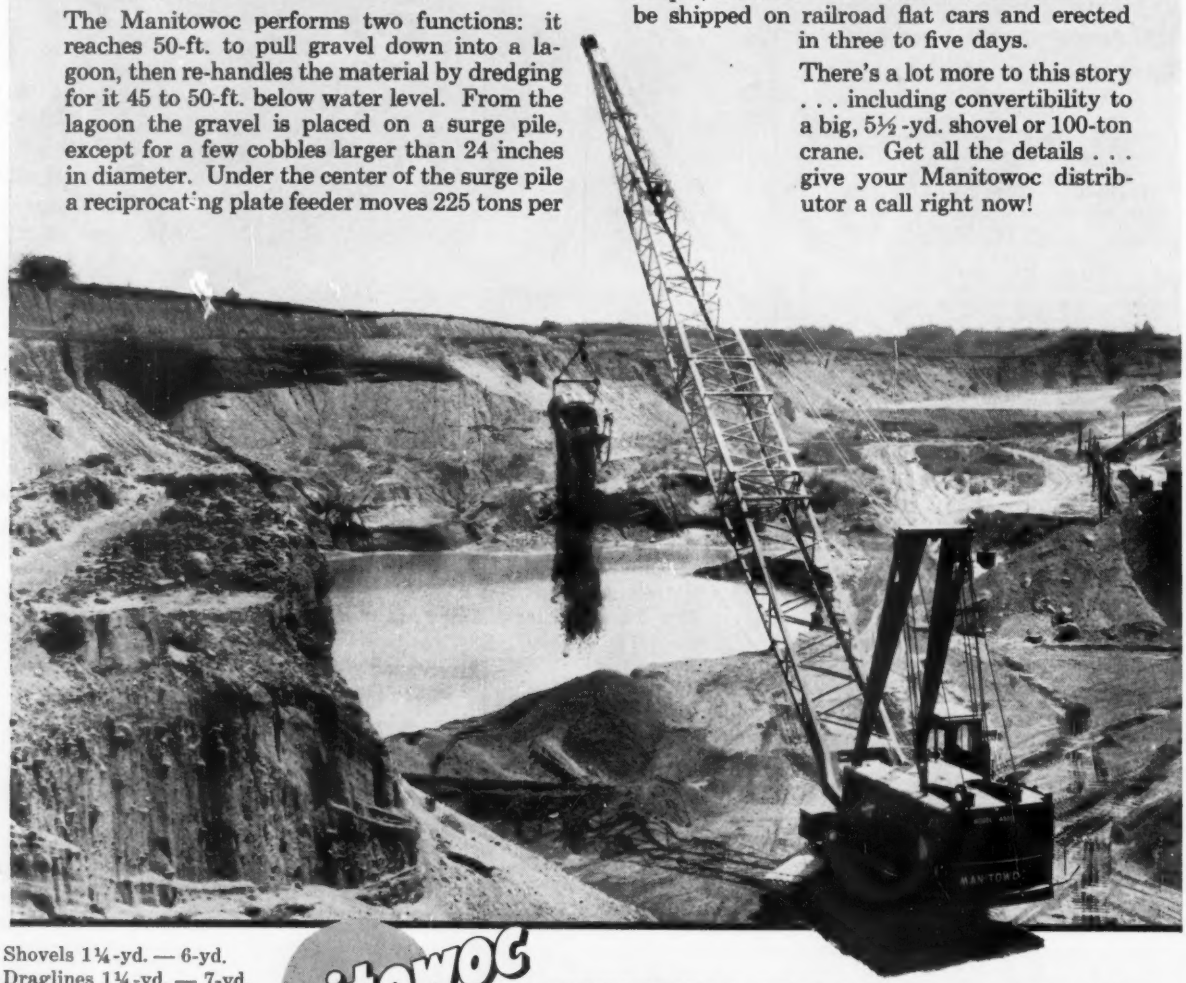
The Standard Slag Company's Crystal Springs washing plant near Massilon, Ohio runs through 225 tons of gravel an hour to operate at top capacity. A Manitowoc Model 4500 dragline with a 5-yd. bucket is used as the primary producer of gravel for the plant. The drag is diesel-powered and is equipped with a 140-ft. boom, providing the great reach needed on this tough job.

The Manitowoc performs two functions: it reaches 50-ft. to pull gravel down into a lagoon, then re-handles the material by dredging for it 45 to 50-ft. below water level. From the lagoon the gravel is placed on a surge pile, except for a few cobbles larger than 24 inches in diameter. Under the center of the surge pile a reciprocating plate feeder moves 225 tons per hour of gravel to an 1,800-ft. conveyor system leading to the processing plant.

The Manitowoc Model 4500 dragline is ideally suited to big scale operations of this sort because it combines unusual stability and long reach with a fast cycle and direct power flow. Modern, balanced design has produced a dragline with a big capacity, yet with the mobility of a two or three-yard rig.

And note that the Model 4500 has no clumsy electric cable trailing behind . . . no expensive, troublesome power installations to maintain. Low cost, easily-understood diesel-power lets you move quickly from one job location to another without the problem of available power. Moving long distances is just as simple, because this modern Manitowoc can be shipped on railroad flat cars and erected in three to five days.

There's a lot more to this story . . . including convertibility to a big, 5½-yd. shovel or 100-ton crane. Get all the details . . . give your Manitowoc distributor a call right now!



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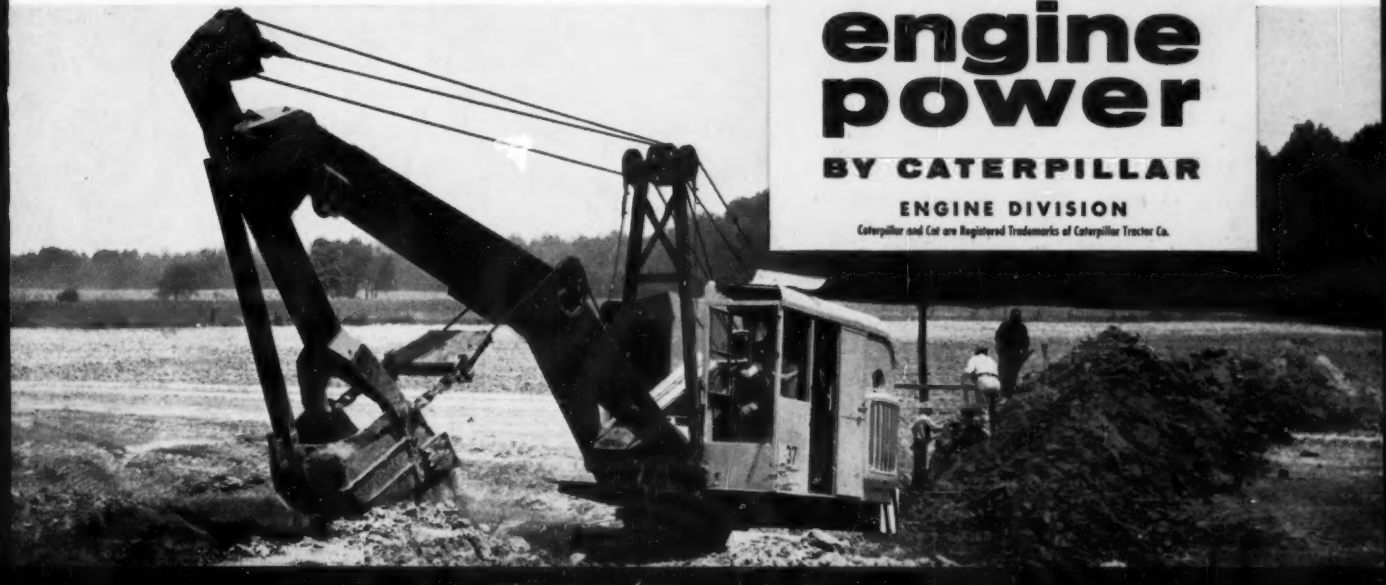

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